Name: Date:

Polynomial Factoring solution (version 657)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 47 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(47)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 188}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-44}}{2}$$

$$x = \frac{-12 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{-12 \pm 2\sqrt{11}\, i}{2}$$

$$x = -6 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 - 9i$ and $-3 - 2i$ in standard form $(a + bi)$.**

Solution

$$(-8 - 9i) \cdot (-3 - 2i)$$

$$24 + 16i + 27i + 18i^2$$

$$24 + 16i + 27i - 18$$

$$24 - 18 + 16i + 27i$$

$$6 + 43i$$

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3. **Write function $f(x) = x^3 - 6x^2 - 4x + 24$ in factored form. I'll give you a hint: one factor is $(x - 2)$.**

Solution

	1	-6	-4	24
2		2	-8	-24
	1	-4	-12	0

$$f(x) = (x-2)(x^2 - 4x - 12)$$

$$f(x) = (x-2)(x-6)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-2) \cdot (x-5)^2 \cdot (x-8)$$

Sketch a graph of polynomial $y = p(x)$.